

CLAIMS

What is claimed is:

5 1. A device for controlling an imaging lens position, which performs a control of focusing based on a distribution of high-frequency components of image signals in a frame, which is acquired according to a focus lens position, comprising:

 an acquirer for information relating to a lens position of a peak focus, which acquires information relating to a lens position of a peak focus, which indicates a
10 focus lens position, in which an integration value of said high-frequency component in a predetermined area in said frame assumes a peak;

 a first storage, which stores information relating to a distribution of high-frequency components, which indicates a distribution of said high-frequency components at a focus lens position indicated by the information relating to a lens
15 position of a peak focus, in which the information relating to a distribution of high-frequency components is correlated with the information relating to a lens position of a peak focus, which is acquired by the acquirer for information relating to a lens position of a peak focus;

 an acquirer for selection information, which acquires selection information
20 indicating which information relating to a distribution of high-frequency components stored by the first storage is selected based on the information relating to a distribution of high-frequency components stored by the first storage; and

 a determinator for an imaging lens position, which determines an imaging lens position, a focus lens position for imaging, based on the information relating to
25 a lens position of a peak focus correlated with the information relating to a distribution of high-frequency components and stored in the first storage, wherein the selection information acquired by the acquirer for selection information indicates that the information relating to a distribution of high-frequency components has been selected.

30 2. The device for controlling an imaging lens position according to Claim 1, wherein

 information relating to a distribution of high-frequency components indicates the size of a high-frequency component corresponding to respective positions of a
35 predetermined area in a frame; and

 an acquirer for selection information comprises:

 a means for computing a high-frequency component index, which computes a high-frequency component indicating a distribution of high-frequency components in a relationship with a predetermined position in the frame; and

40 a means for generating selection information dependent on a high-frequency component index, which generates selection information based on the high-frequency component index.

45 3. The device for controlling an imaging lens position according to Claim 2, wherein

 a means for computing a high-frequency component index comprises:

a scanner, which starts scanning information relating to a distribution of high-frequency components in a predetermined position in a frame as a starting position for scanning.

5 4. The device for controlling an imaging lens position according to Claim 3, wherein

 a means for computing a high-frequency component index computes information relating to an increase of integration, which indicates an increase of integration value of an image signal along a scanning path of a scanner; and

10 a means for generating selection information dependent on a high-frequency component index generates selection information for selecting information relating to a distribution of high-frequency components having the largest increase according to information relating to an increase of integration.

15 5. The device for controlling an imaging lens position according to Claim 3, wherein

 a means for computing a high-frequency component index computes information relating to an amount of scanning as a high-frequency component index, which indicates an amount of scanning by a scanner until the maximal value of a high-frequency component of an image signal appears; and

20 a means for generating selection information dependent on a high-frequency component index generates selection information for selecting information relating to a distribution of high-frequency components having the smallest value of information relating to the amount of scanning.

25 6. The device for controlling an imaging lens position according to Claim 2, wherein

 a high-frequency component index is barycentric deviation information indicating a distance between a barycentric position of a high-frequency component and a predetermined position; and

30 a means for generating selection information dependent on a high-frequency component index, which generates selection information for selecting information relating to a distribution of high-frequency components having the smallest value of the barycentric deviation information.

35 7. The device for controlling an imaging lens position according to any one of Claims 2 to 6, wherein a predetermined position is a central point of a frame.

40 8. The device for controlling an imaging lens position according to any one of Claims 2 to 6, comprising a setting unit for a predetermined position, which sets a predetermined position.

 9. The device for controlling an imaging lens position according to Claim 1, wherein

information relating to a distribution of high-frequency components indicates the size of a high-frequency component corresponding to respective positions of a predetermined area in a frame; and

an acquirer for selection information comprises:

5 a means for displaying an image of a distribution of high-frequency components, which displays information relating to a distribution of high-frequency components as an image stored in a first storage; and

10 a means for inputting a selection, which acquires selection information from an operator based on the image of a distribution of high-frequency components displayed by said means for displaying an image of a distribution of high-frequency components.

10. A device for controlling an imaging lens position, which performs a control of focusing based on a distribution of high-frequency components of image signals in a frame, which is acquired according to a focus lens position, comprising:

15 an acquirer for information relating to a lens position of a peak focus, which acquires information relating to a lens position of a peak focus, which indicates a focus lens position, in which an integration value of said high-frequency component in a predetermined area in said frame assumes a peak;

20 a computer for a high-frequency component index, which computes a high-frequency component index indicating a distribution of said high-frequency component in a relationship with a predetermined position in the frame;

25 a second storage, which stores a high-frequency component index, which is computed by the computer for a high-frequency component index at a focus lens position indicated by the information relating to a lens position of a peak focus, in which the high-frequency component index is correlated with the information relating to a lens position of a peak focus, which is acquired by the acquirer for information relating to a lens position of a peak focus;

30 an acquirer for selection information, which acquires selection information indicating which high-frequency component index stored by the second storage is selected based on the high-frequency component index stored by the second storage; and

35 a determinator for an imaging lens position, which determines an imaging lens position, a focus lens position for imaging, based on the information relating to a lens position of a peak focus correlated with the high-frequency component index and stored in the second storage, wherein the selection information acquired by the acquirer for selection information indicates that the high-frequency component index has been selected.

40 11. The device for controlling an imaging lens position according to any one of Claims 1 to 10, wherein an image signal is a luminance signal.

45 12. The device for controlling an imaging lens position according to any one of Claims 1 to 10, wherein an image signal is a signal acquired from one or a combination of RGB signals.

13. The device for controlling an imaging lens position according to any one of Claims 1 to 10, wherein an image signal is a signal acquired from one or a combination of CMYG signals.

5 14. A method for controlling an imaging lens position, which performs a control of focusing based on a distribution of high-frequency components of image signals in a frame acquired according to a focus lens position, comprising:

 a step of acquiring information relating to a lens position of a peak focus, which acquires information relating to a lens position of a peak focus, which
10 indicates a focus lens position, in which an integration value of said high-frequency component in a predetermined area in said frame assumes a peak;

 a first step of storing, which stores information relating to a distribution of high-frequency components, which indicates a distribution of said high-frequency component at a focus lens position indicated by the information relating to a lens
15 position of a peak focus, in which the information relating to a distribution of high-frequency components is correlated with the information relating to a lens position of a peak focus, which is acquired by the step of acquiring information relating to a lens position of a peak focus;

 a step of acquiring selection information, which acquires selection
20 information indicating which information relating to a distribution of high-frequency components stored by the step of storing is selected based on the information relating to a distribution of high-frequency components stored by the step of storing; and

 a step of determining an imaging lens position, which determines an imaging
25 lens position, a focus lens position for imaging, based on the information relating to a lens position of a peak focus correlated with the information relating to a distribution of high-frequency components and stored by the step of storing, in which the selection information acquired by the step of acquiring selection information indicates that the information relating to a distribution of
30 high-frequency components has been selected.

15. A method for controlling an imaging lens position, which performs a control of focusing based on a distribution of high-frequency components of image signals in a frame, which is acquired according to a focus lens position, comprising:

 a step of acquiring information relating to a lens position of a peak focus, which acquires information relating to a lens position of a peak focus, which
35 indicates a focus lens position, in which an integration value of said high-frequency component in a predetermined area in said frame assumes a peak;

 a step of computing a high-frequency component index, which computes a high-frequency component index indicating a distribution of said high-frequency component in a relationship with a predetermined position in the frame;
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 a second step of storing, which stores the high-frequency component index, which is computed by the step of computing high-frequency component index at a focus lens position indicated by the information relating to a lens position of a peak focus, in which the high-frequency component index is correlated with the

information relating to a lens position of a peak focus, which is acquired by the step of acquiring information relating to a lens position of a peak focus;

a step of acquiring selection information, which acquires selection information indicating which high-frequency component index stored by the step of storing is selected based on the high-frequency component index stored by the step of storing; and

a step of determining an imaging lens position, which determines an imaging lens position, a focus lens position for imaging, based on the information relating to a lens position of a peak focus correlated with the high-frequency component index and stored by the step of storing, in which the selection information acquired by the step of acquiring selection information indicates that the high-frequency component index has been selected.

16. A device for controlling an imaging lens position comprising:

an acquirer for an image signal, which acquires an image signal from a large frame region in an imaging region and from a small frame region, which is a portion of the large frame region, in which the large frame region and the small frame region are correlated with a focus lens position;

an acquirer for contrast information, which acquires contrast information indicating contrast from said image signal, which is correlated with said focus lens position;

an acquirer for information relating to a lens position of a peak focus, which acquires information relating to a lens position of a peak focus indicating a focus lens position having a peak indicated by said contrast information; and

a determinator for an imaging focus lens position, which determines suitable focus lens position for imaging; wherein

said determinator for an imaging focus lens position determines an imaging focus lens position if information relating to a lens position of a peak focus is acquired from said small frame region, based on that information relating to a lens position of a peak focus, and if information relating to a lens position of a peak focus is not acquired from said small frame region, based on information relating to a lens position of a peak focus of said large frame region.

17. The device for controlling an imaging lens position according to Claim 16, wherein an image signal is a luminance signal.

18. The device for controlling an imaging lens position according to Claims 16, wherein an image signal is a signal acquired from one or a combination of RGB signals.

19. The device for controlling an imaging lens position according to Claims 16, wherein an image signal is a signal acquired from one or a combination of CMYK signals.

20. The device for controlling an imaging lens position according to any one of Claims 16 to 19, wherein said small frame region is arranged in the central portion of said large frame region.

5 21. The device for controlling an imaging lens position according to any one of Claims 16 to 19 further comprising a changer for arrangement, which changes the arrangement of said small frame region and/or large frame region.

10 22. The device for controlling an imaging lens position according to any one of Claims 20 or 21 comprising a changer for shape of region, which changes the size and/or aspect ratio of said small frame region and/or large frame region.

15 23. The device for controlling an imaging lens position according to any one of Claims 16 to 19, wherein a plurality of said small frame regions is arranged in one of said large frame regions.

 24. The device for controlling an imaging lens position according to Claim 23, wherein a plurality of said large frame regions are arranged in an imaging region.

20 25. A device for controlling an imaging lens position, comprising:
a middle frame region, which includes said small frame region and is included in said large frame region;
said acquirer for an image signal; and
said acquirer for contrast information; wherein
25 an image signal of said middle frame region is processed similarly to signals of said small and of said large frame region; and
said determinator for an imaging focus lens position determines an imaging lens position in the order of the small frame region, the middle frame region, and the large frame region according to priority.

30 26. The device for controlling an imaging lens position according to Claim 25, wherein said middle frame region comprises a plurality of middle frame regions having a further inclusive relationship.